

DaimlerChrysler AG

Patent Claims

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1. A drive train comprising
  - a gear unit which has at least five transmission stages for a first operating mode, which transmission stages are implemented by means of a plurality of planet sets (TE, TA, TU),
    - a drive unit which has a drive connection to an output shaft (A) via an input shaft (E) and the gear unit,
    - an additional electric drive unit (second electric drive unit 32),
      - the gear unit having a pick off gear unit (TE)
        - which, in the first operating mode, is intermediately connected into the force flow between the input shaft (E) and output shaft (A), and
          - by means of which, in a second operating mode, the drive movement of the drive unit and that of the second electric drive unit (32) are superimposed so as to bring about an infinitely variable transmission ratio of the drive movement of the input shaft (E) with respect to an output element (VE) of the pick off gear unit (TE),
    - and the gear unit having a second component transmission (TA, TU),
      - which, in the first operating mode, is intermediately connected into the force flow between the input shaft (E) and output shaft (A), and
        - which has at least two driving ranges in which, in the second operating mode, the drive movement of the output element (VE) is transferred to the output shaft (A).

2. The drive train as claimed in claim 1, characterized in that in a first driving range the output is carried out by means of an output element (VE) of the pick off gear unit (TE), and in a second driving range the output is carried out by means of two output elements (VE, HA) of the pick off gear unit (TE) with respect to the second component transmission (TA).

3. The drive train as claimed in claim 1 or 2, characterized in that common shifting elements are used to bring about the drive connection in the first and second operating modes.

4. The drive train as claimed in one of claims 1 to 3, characterized in that in the second operating mode switching over between the first driving range and the second driving range takes place without acceleration or deceleration of the inert masses.

5. The drive train as claimed in one of the preceding claims, characterized in that a control unit which contains a driving strategy which permits the shifting elements and the drive units to be actuated in order to select an operating mode is assigned to the drive train.

6. The drive train as claimed in claim 5, characterized in that the control unit takes into account a charge state of a battery in order to select an operating mode.

7. The drive train as claimed in claim 5 or 6, characterized in that the control unit takes into account at least one ambient parameter in order to select an operating mode.

8. The drive train as claimed in one of claims 5 to 7, characterized in that the control unit takes into

account a vehicle parameter in order to select an operating mode.

9. The drive train as claimed in one of claims 5 to  
5 8, characterized in that the control unit takes into account a movement variable of the vehicle in order to select an operating mode.

10. The drive train as claimed in one of claims 5 to  
10 9, characterized in that the control unit takes into account at least one variable which is dependent on a driver in order to select an operating mode.

11. The drive unit as claimed in one of the preceding  
15 claims, characterized in that shifting elements (KE,  
KG) are provided and can be used, in one shifted position, to bring about a drive connection of the additional electric drive unit (32) to the input shaft (E), and in one shifted position can bring about a  
20 drive connection to a transmission element (PTE) of the pick off gear unit (TE).

12. The drive unit as claimed in one of the preceding claims, characterized in that a further electric drive  
25 unit (31) is provided and can be used to feed a drive torque directly into an engine shaft (15) or the input shaft (E).

13. The drive unit as claimed in claim 12,  
30 characterized in that a control unit is assigned to the drive train and permits the shifting elements and the drive units to be actuated in such a way that the drive unit which is embodied as an internal combustion engine can either be started solely by means of the second  
35 electric drive unit (32) or by means of the first electric drive unit (31) and the second electric drive unit (32).

14. The drive unit as claimed in one of the preceding claims, characterized in that a battery is connected to the additional electric drive unit (32) and energy of the drive train, of the first electric drive unit (31)  
5 and/or of the internal combustion engine is fed back into said battery in a generator operating mode of the additional electric drive unit (32).